

PATENT COOPERATION TREATY :

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 47309	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IT 03/00198	International filing date (day/month/year) 02.04.2003	Priority date (day/month/year) 02.04.2003
International Patent Classification (IPC) or both national classification and IPC B26F1/20		
Applicant PANTEX SUD S.R.L.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 4 sheets.

- This report contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain documents cited
 - ☐ Certain defects in the international application
 - ☐ Certain observations on the international application

Date of submission of the demand 09.10.2004	Date of completion of this report 22.07.2005
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/IT 03/00198**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-14 as originally filed

Claims, Numbers

1-34 filed with telefax on 15.02.2005

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-34
	No: Claims	
Inventive step (IS)	Yes: Claims	1-34
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-34
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT 03/00198

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

The invention relates to a method and a device for the perforation of a web material destined to make absorbent items for personal hygiene, filters. According to the invention, the web material is preheated before it is fed to the nip between the perforator rollers. By preheating the web material it is possible to take the temperature of the material to a value that reduces the stay time required by the material in contact with the perforator rollers, allowing correct and accurate perforation of all the material while feeding the material at a high speed and thus reducing the time available to the perforator rollers to carry out perforation. The quantity of heat to be supplied to the web material by the rollers to reach the temperature required for the perforation is lower. The time for which the web material remains in contact with rollers may be reduced.

EP-A-0 598 970, DE-A_197 50 459 and US-B-6 395 211 disclose a method to produce a perforated web material in which the web is perforated through the combined effect of pressure and heat by passing through the nip defined by two heated rollers. None of the documents discloses the preheating before the web is fed through a nip.

New Claims

- 5 1. A method to produce a perforated web material, wherein the web material (N) is fed through a nip (11) between a first roller (7) and a second roller (9) rotating in opposite directions and pressed against each other, the first roller (7) being provided with protuberances (7P) for perforation, characterized in that the web material is preheated before being
10 fed into said nip, and the web is fed into the nip in a preheated condition at a temperature higher than the ambient temperature.
2. Method as claimed in claim 1, characterized in that at least one of said first and second roller (7, 9) is heated.
3. Method as claimed in claim 1 or 2, characterized in that said first
15 and said second roller rotate with a different peripheral speed to each other.
4. Method as claimed in claim 3, characterized in that said first roller (7) rotates at a higher peripheral speed than said second roller (9).
5. Method as claimed in one or more of the previous claims, characterized in that said web material is a nonwoven fabric.
- 20 6. Method as claimed in claim 5, characterized by:
- producing at least a web of fibres (V);
 - bonding said fibres to form a nonwoven fabric;
 - feeding the preheated nonwoven fabric into said nip (11).
7. Method as claimed in claim 6, characterized in that said web (V)
25 is produced and bonded in series upstream of said nip.
8. Method as claimed in claim 6 or 7, characterized by the phases of:
- producing at least a web of unbonded fibres (V);
 - feeding said web of unbonded fibres (V) through at least a heating and
30 bonding station to bond said fibres and form a nonwoven fabric;
 - feeding the nonwoven fabric preheated in said at least a heating and bonding station into said nip (11).
9. Method as claimed in claim 8, characterized in that heating and bonding are performed using an air-through system.
- 35 10. Method as claimed in one or more of the claims from 6 to 9, characterized in that the nonwoven fabric is fed into said nip with an input

speed equal to or lower than the peripheral speed of the first roller (7).

11. Method as claimed in claim 12, characterized in that said second roller (9) is rotated at a peripheral speed lower than or equal to the peripheral speed of said first roller.

5 12. Method as claimed in claim 10 or 11, characterized in that the feed speed of the nonwoven fabric into said nip is between 90% and 100% of the peripheral speed of the first roller (7).

10 13. Method as claimed in claim 12, characterized in that the feed speed of the nonwoven fabric into said nip is between 90% and 110% of the peripheral speed of the second roller (9).

14. Method as claimed in claim 12 or 13, characterized in that the peripheral speed of the second roller (9) is between 50% and 100% of the peripheral speed of the first roller (7).

15. Method as claimed in claim 5, characterized by the phases of:

- 15 • producing at least a web of unbonded fibres (V);
- feeding said web of unbonded fibres to a heating station (3);
- feeding the web of fibres preheated in said heating station into said nip (11);
- 20 • bonding the fibres to form the nonwoven fabric and perforating the web of fibres in said nip (11).

16. Method as claimed in claim 15, characterized in that the web of unbonded fibres (V) is fed into said nip with an input speed lower than the peripheral speed of the first roller (7), said peripheral speed of the first roller being equal to or higher than the peripheral speed of the second roller (9).

25 17. Method as claimed in claim 16, characterized in that a delivery speed equal to or higher than the peripheral speed of the first roller is imparted to the web material delivered from said nip.

30 18. Method as claimed in claim 16 or 17, characterized in that the feed speed of the web of fibres into said nip is between 50% and 90% of the peripheral speed of the first roller.

19. Method as claimed in one or more of the claims from 5 to 18, characterized in that two or more web of fibres (V1, V2) are coupled and joined together.

20. Method as claimed in claim 19, characterized by: forming at

least a first and a second web of unbonded fibres (V1, V2); joining said first and said second web together and consolidating said fibres in said heating station.

21. Method as claimed in claim 19, characterized by:

- 5 • forming at least a first and a second web of unbonded fibres; feeding said first and second web of unbonded fibres to one or two heating and bonding stations for preheating and separately bonding the fibres of the first and of the second web to form two nonwoven fabrics;
- feeding said two preheated nonwoven fabrics into said nip;
- 10 • perforating and joining together said two nonwoven fabrics in said nip.

22. Method as claimed in one or more of the claims from 5 to 21, characterized in that said web material comprises bicomponent fibres.

23. Method as claimed in one or more of the claims from 5 to 23, characterized in that a plastic film (Fp) is combined with said nonwoven fabric
15 or with said web of unconsolidated fibres.

24. Method as claimed in one or more of the claims from 1 to 5, characterized in that said web material comprises at least a plastic film (Fp).

25. A production line to produce a perforated web material, comprising at least a path to feed a web material (V, V1, V2, Fp) to a
20 perforation station (7, 9) comprising a first roller (7) and a second roller (9) rotating in opposite directions and pressed against each other, defining a nip (11) through which the web material is fed; the first roller (7) being provided with protuberances (7P) for perforation; characterized in that a heating
25 station (3) is provided upstream of said perforation station, through which said feed path passes and in which the web material is preheated before being fed to said perforation station, said heating station and said perforation station being arranged such that the web enters said perforation station in a preheated condition at a temperature higher than the ambient temperature.

26. Production line as claimed in claim 25, characterized in that at
30 least one of the rollers of the perforation station is heated.

27. Production line as claimed in claim 25 or 26, characterized in that the two rollers of the perforation station are controlled so that they rotate at different peripheral speeds from each other.

28. Production line as claimed in claim 27, characterized in that said

first roller (7) rotates at a peripheral speed higher than the peripheral speed of said second roller (9).

29. Production line as claimed in one or more of the claims from 25 to 28, characterized in that bonding devices are provided along said feed path to bond the fibres of a web of unbonded fibres and form a nonwoven fabric, which is fed to said perforation station.

30. Production line as claimed in claim 29, characterized in that said bonding devices comprise a bonding system of the air-through type.

31. Production line as claimed in one or more of the claims from 25 to 30, characterized in that it comprises at least a machine (1; 1A, 1B) to produce a web of fibres (V; V1, V2).

32. Production line as claimed in one or more of the claims from 25 to 30, characterized in that it comprises joining devices to join together two or more layers destined to form said web material.

33. Production line as claimed in claim 32, characterized in that said joining devices comprise means to consolidate two webs of fibres to each other.

34. Production line as claimed in one or more of the claims from 25 to 33, characterized in that it comprises two feed paths for at least two components destined to form said web material, said two feed paths uniting before passing through said perforation station.